REMARKS

Summary of the Office Action

Claims 1-32 were pending in this application.

The Examiner objected to the specification as containing informalities because of the use of the term "packet." The Examiner contends that applicants have improperly used the term packet.

The Examiner rejected claims 1-32 under 35 U.S.C. § 112 as being indefinite for using the term "packets" instead of "sub-packets".

The Examiner rejected claims 1-32 under 35 U.S.C. § 102(b) as being anticipated by the article "A Prototype of an AAL for High Bit Rate Real-Time Data Transmission System over ATM Networks Using a RSE CODEC" by Eilers et al. (hereinafter "Eilers").

The Examiner rejected claims 4, 5, 20, and 21 under 35 U.S.C. § 103(a) as being obvious over Eilers in view of Buckland U.S. Patent No. 5,642,347 (hereinafter "Buckland").

The Examiner rejected claims 9, 13, 16, 25, 29, and 32 under 35 U.S.C. § 103(a) as being obvious over Eilers in view of Johnston et al. U.S. Patent No. 5,414,707 (hereinafter "Johnston").

The Examiner rejected claims 12, 15, and 31 under 35 U.S.C. § 103(a) as being obvious over Eilers in view of Rich U.S. Patent No. 5,784,370 (hereinafter "Rich").

The Examiner rejected claims 1-32 under 35 U.S.C. § 103(a) as being obvious over Kato U.S. Patent No. 5,844,918 (hereinafter "Kato").

Summary of Applicants' Reply

Applicants have amended claims 1, 2, 4-6, 11, 12, 14, 17, 18, 20-22, 27, and 30 to more particularly define applicants' claims. No new subject matter has been added and

the amendments are fully supported by the original specification.

The Examiner's rejections are respectfully traversed.

Applicants' Reply to Objections to the Specification

The Examiner contends that "Applicant's use of the term 'packet' implies that each block of bits so called is independently routable, however all of applicant's 'packets' are apparently not independently routable." This objection is respectfully traversed.

According to The Internet Encyclopedia (Volume 2, November 2003, p.184) the word "packet" is defined as "a 'bunch' of data, usually with delimiting headers and trailers, typically tens to tens of thousands of octets, transmitted as a unit." Thus, the term packet does not require the concept of routability. Therefore, there is no basis for the Examiner's objection and this objection should be withdrawn.

Applicants' Reply to the Rejection Under 35 U.S.C. § 112

Claims 1-32 have been rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that applicants regard as the invention because the term "packets" has been used instead of "sub-packets" in the phrase "identification packets" in claims 1, 4-6, 11, 12, 14, 17, 20-22, 27, and 30.

Although applicants disagree with the Examiner's objections, in an effort to expedite prosecution applicants have amended claims 1, 4-6, 11, 12, 14, 17, 20-22, 27, and 30 to replace the term "packets" in the phrase "identification packets" with the term "sub-packets" as requested by the Examiner. Applicants respectfully submit that claims 1-32 are now fully compliant with 35 U.S.C. § 112. Accordingly,

applicants respectfully request that the rejection under 35 U.S.C. § 112 be withdrawn.

Applicants' Reply to the Rejection of Independent Claims under 35 U.S.C. § 102(b)

Claims 1, 6, 11, 14, 17, 22, 27, and 30 are rejected under 35 U.S.C. § 102(b) as being anticipated by Eilers.

Applicants' amended independent claim 1 is directed toward circuitry for maintaining data integrity across data links. An encoding circuit divides an encoded data frame into a plurality of data sub-packets and a plurality of sequential identification sub-packets. A transmitter circuit transmits the plurality of data sub-packets and the plurality of sequential identification sub-packets by alternatively transmitting a data sub-packet and a sequential identification sub-packet. A receiver receives a sub-plurality of these sub-packets. A decoding circuit identifies each of the received sequential identification sub-packets and obtains data positions representing the received data sub-packets from the received sequential identification sub-packets. The decoding circuit then stores the received data sub-packets in the sequence of the data frame in response to obtaining the data positions. The stored data also includes place-holder positions for a sub-plurality of data sub-packets that were not received by the receiver circuit. The sub-plurality of data sub-packets not received by the receiver circuit are recovered using the stored data sub-packets.

For example, as described in applicants' specification, an FEC data frame is broken up into data sub-packets and each transmission of a data sub-packet is preceded by the transmission of an IDLE/SYNC sub-packet. After a data loss, data positions corresponding to the lost data may be obtained at the data receiver using the received IDLE/SYNC

sub-packets. The received portions of data are stored in their positions within the data frame and the lost portions may be recovered based on the received data.

Eilers refers to a data transmission system that takes basic data, encodes the data using a Reed-Solomon encoding process to obtained encoded data, and interleaves the encoded data. The interleaved encoded data is divided into transmission cells and each transmission cell is appended with a sequence number. A cyclic redundancy check is generated over the entire cell, including both data and sequence number bytes, and is appended to each cell prior to transmission. At the receive-side, the cyclic redundancy check is processed to correct cell losses.

However, Eilers does not show transmitting a plurality of data sub-packets and a plurality of sequential identification sub-packets by alternatively transmitting a data sub-packet and a sequential identification sub-packet. Instead Eilers shows transmitting one cell of data at a time, where each cell includes contents corresponding both to data and a sequence number, and where each cell has been encoded by a cyclic redundancy check. Because each transmitted cell in Eilers is encoded to include both data and sequence number information, Eilers does not show or suggest "a transmitter circuit" in which "a plurality of data sub-packets" and a "plurality of sequential identification sub-packets" are transmitted by "alternatively transmitting a sequential identification sub-packet and a data sub-packet." In contrast to the system of applicants' amended independent claim 1, in which data sub-packets are transmitted separately from sequence identification sub-packets, the system of Eilers transmits data and sequence number information together in the same transmission cell. Furthermore, because Eilers binds data and sequence number information together using a cyclic redundancy check on each cell, Eilers does not show or suggest transmitting data sub-packets and sequence numbers separately.

For at least these reasons, applicants respectfully request that the rejection of amended independent claim 1 under 35 U.S.C. § 102(b) be withdrawn.

Applicants respectfully request that the rejection of amended independent claims 6, 11, 14, 17, 22, 27, and 30 under 35 U.S.C. § 102(b) be withdrawn for at least the same reasons as amended independent claim 1.

Applicants' Reply to the Rejection of Independent Claims under 35 U.S.C. § 103(a)

Claims 1, 6, 11, 14, 17, 22, 27, and 30 are rejected under 35 U.S.C. § 103(a) as being obvious over Kato.

Applicants' amended independent claim 1 is directed toward circuitry for maintaining data integrity across data links. An encoding circuit divides an encoded data frame into a plurality of data sub-packets and a plurality of sequential identification sub-packets are inserted in between the plurality of data sub-packets. A transmitter circuit transmits the data sub-packets with the inserted plurality of sequential identification sub-packets and a receiver receives a sub-plurality of these sub-packets. A decoding circuit identifies each of the received sequential identification sub-packets and obtains data positions representing the received data sub-packets from the received sequential identification sub-packets. The decoding circuit then stores the received data sub-packets in the sequence of the data frame in response to obtaining the data positions. The stored data also includes place-holder positions for a sub-plurality of data sub-packets that were not received by the receiver circuit. The sub-plurality of data sub-packets not received by the receiver circuit are recovered using the stored data sub-packets.

For example, as described in applicants' specification, an FEC data frame is broken up into data sub-

packets and each data sub-packet is proceeded by an IDLE/SYNC sub-packet. After a data loss, data positions corresponding to the lost data may be obtained at the data receiver using the received IDLE/SYNC sub-packets. The received portions of data are stored in their positions within the data frame and the lost portions may be recovered based on the received data.

Kato refers to a digital transmission system that takes basic data, appends a BCH-based parity code and divides the data into smaller sub-packets. An error detecting code is appended to each of the divided sub-packets. If an error is detected in any of the divided sub-packets, a request for retransmission is sent.

However, Kato does not show determining data positions corresponding to received sequential identification sub-packets and using the determined data positions to recover data sub-packets that are not received. Instead, the packet headers of Kato are merely contain a CRC code (i.e., an error detecting code) that is used to detect errors in the packet. If an error is detected using the CRC code, an ARQ protocol is used to request retransmission of the corrupted packet. Because each packet is retransmitted whenever there is an error, Kato does not show or suggest "obtaining data positions representing said received data sub-packets" and "storing each of said received data sub-packets . . . in response to obtaining said data positions " and "recovering the sub-plurality of data sub-packets not received using the stored data sub-packets." In contrast to the system of applicants' amended independent claim 1, in which the entire data frame can be decoded from a sub-plurality of received packets stored in their proper order, the system of Kato relies upon retransmission of erroneous packets to obtain a complete data. Furthermore, because Kato does not attempt to piece together only a sub-plurality of packets, there is no reason for Kato to use data positions obtained from sequential identification sub-packets to store the received data in a sequence, as

recited by applicants' claims.

For at least these reasons, applicants respectfully request that the rejection of amended independent claim 1 under 35 U.S.C. § 103(a) be withdrawn.

Applicants respectfully request that the rejection of amended independent claims 6, 11, 14, 17, 22, 27, and 30 under 35 U.S.C. § 103(a) be withdrawn for at least the same reasons as amended independent claim 1.

Applicants' Reply to the Rejection of Dependent Claims

Dependent claims 2-5, 7-10, 12, 13, 15, 16, 18-21, 23-26, 28, 29, 31, and 32 are rejected by the Examiner. Claims 2-5, 7-10, 12, 13, 15, 16, 18-21, 23-26, 28, 29, 31, and 32 are rejected under 35 U.S.C. § 102(b) as being anticipated by Eilers and are also rejected under 35 U.S.C. § 103(a) as being obvious over Kato. Claims 4, 5, 20, and 21 are rejected under 35 U.S.C. § 103(a) as being obvious over Eilers in view of Buckland. Claims 12, 15, and 31 are rejected under 35 U.S.C. § 103(a) as being obvious over Eilers in view of Rich. Claims 9, 13, 16, 25, 29, and 32 are rejected under 35 U.S.C. § 103(a) as being obvious over Eilers in view of Johnston.

Claims 2-5, 7-10, 12, 13, 15, 16, 18-21, 23-26, 28, 29, 31, and 32 are variously dependent on applicants' allowable amended independent claims 1, 6, 11, 14, 17, 22, 27, and 30. Accordingly, for at least this reason, the rejection of claims 2-5, 7-10, 12, 13, 15, 16, 18-21, 23-26, 28, 29, 31, and 32 should be withdrawn.

Applicants' Reply to the Examiner's Official Notices

The Examiner acknowledged that Kato fails to show various features of applicants claims. These features include: a) "packet headers that provide 'identification' of the position of the packet in a sequence of packets", b)

"counting bit clocks while receiving packed data cells", c) Reed-Solomon coding, d) "interleaving FEC-encoded data among data packets", e) "encoding a clock signal within the data to be transmitted or deriving a clock signal from the transmitted data", and f) "manipulating data as bytes or words before or after serial transmission, thus requiring a 'serializer' and a 'de-serializer'." For all of these features the Examiner has taken Official Notice that each of these features were "well-known at the time the invention was made." Applicants respectfully traverse the Examiner's Official Notices.

The Examiner may only take Official Notice of facts outside of the record which are "capable of such instant and unquestionable demonstration as to defy dispute" (MPEP § 2144.03(A)). Applicants submit that there is no objective basis to conclude that these concept were well known beyond dispute as of applicants' date of invention. Therefore, applicants traverse the Official Notices because it is at least disputable whether the noticed concept was well-known at the time of applicants' invention. If the Examiner maintains the rejection, applicants respectfully request that the Examiner provide references in support of the Official Notices (see MPEP § 2144.03(C)).

Conclusion

The foregoing demonstrates that this application is patentable. Accordingly, reconsideration and allowance of this application are respectfully requested.

Respectfully submitted,

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